Name of Organization: Minnesota Pollution Control Agency

Type of Organization: State

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Environmental Outcomes

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Project Title: Brominated Flame Retardants - Emerging Great Lakes Issue

Project Category: Emerging Issues

Rank by Organization (if applicable): 1

Total Funding Requested ($): 62,000 **Project Duration:** 1 Years

Abstract:

Despite substantially reduced emissions of most well known persistent bioaccumulative toxic pollutants (PBTs), the danger is far from over. Brominated Flame Retardants (BFRs), an unknown PBTs, are chemically similar to polychlorinated biphenyls (PCBs) and dibenzodioxins. Like these compounds, BFRs bioaccumulate when introduced into aquatic or terrestrial ecosystems. Unlike PCBs and Dioxins, PFRs are manufactured and used in increasing quantities. Like PBTs, BFRs cross boundaries between environmental media, Unlike many PBTs, BFRs are not regulated by any laws, regulations, or any programs. Information on the sources, formation, transport, and fate of PFRs in the Great Lakes region is extremely limited. For all these reasons, they raise unique, and almost impossible management challenges.

Since our understanding of BFRs is in its infancy, the Minnesota Pollution Control Agency (MPCA) proposes to investigate the major sources of BFRs and quantify their contribution to environmental emissions in Great Lakes Region.

Geographic Areas Affected by the Project

States:

- [ ] Illinois
- [ ] Indiana
- [ ] Michigan
- [x] Minnesota
- [x] New York
- [x] Pennsylvania
- [x] Wisconsin
- [x] Ohio

Lakes:

- [x] Superior
- [ ] Huron
- [ ] Michigan
- [ ] Erie
- [ ] Ontario
- [ ] All Lakes

Geographic Initiatives:

- [ ] Greater Chicago
- [ ] NE Ohio
- [ ] NW Indiana
- [ ] SE Michigan
- [ ] Lake St. Clair

Primary Affected Area of Concern: St. Louis River, MN

Other Affected Areas of Concern:

For Habitat Projects Only:

Primary Affected Biodiversity Investment Area:

Other Affected Biodiversity Investment Areas:

Problem Statement:

Brominated Flame Retardants (BFRs) chemicals are added to many common items such as plastics, paints, textiles, machines and electronic devices to reduce flammability, and many thousand tons are produced annually. In recent years, however, an unexpected and undesirable consequence of widespread use of BFRs has been observed. These chemicals have been assessed with regard to intrinsic toxicity, chemical stability, potential to form dibenzo-dioxins and dibenzo-furans under incineration, and also fat-solubility, and hence bioaccumulative properties. BFRs may be present at harmful levels in the environment and remain for generations in humans, wildlife and aquatic life. They may interfere with the normal functioning of endocrine or hormone systems, central nervous systems, and immune systems. They may cause a variety of problems with development, behavior, and reproduction (i.e. birth defects in humans and/or reduced populations and altered community structures within ecosystems), and cancer.

Since the occurrence of BFRs in the Great Lakes region is almost non-existent, we propose to build on this data to identify the major sources of BFRs and quantify their contribution to environmental emissions in Great Lakes Region.

Proposed Work Outcome:

This MPCA Proposed Project will be presented in the following four-step methodology:

1. Information gathering for each BFRs of concern: sources and volume of releases, physical/chemical properties, and bioaccumulation, persistence, and toxicity information.

2. An International and national assessment of current regulations and programs. Use existing programs and processes whenever possible, be complementary and coordinated with programs and efforts of other states, national, binational, and international Agencies.

3. Identification of cost effectiveness options for reductions.

4. Recommendations on pollution prevention, and possible implementation actions.

This project will help us to better understand the environmental impacts of BFRs. It will help establish benchmarks to guide future monitoring efforts to track the health of the environment. If needed, it will form the basis of regulatory measures to reduce Minnesota's emissions and Minnesota citizen exposure. This "information gathering" step is essential before proceeding to the risk assessment or risk management process. The results of the proposed study will provide vital

information for the international efforts to virtually eliminate toxic substances from the Great Lakes regions. While large amounts of study have been directed at pollution of the Great Lakes by chlorinated compounds such as dioxins and PCBs, virtually no data have been collected on brominated compounds. Yet, as explained, brominated compounds are widely used, in many cases for the same purposes as the chlorinated compounds.

This study will provide some unique non-PCB type data, data that in hindsight should have been obtained before. If cost-effective clean-up decisions are to be made concerning refractory pollutants, PFRs need to be considered as part of an overall strategy.

The proposed work will benefit all parties seeking to improve environmental health by eliminating bioaccumulating contaminants. This work will support efforts outlined by the USEPA, as well as state environmental agencies. It will help us to better understand the environmental impacts of PFRs. It will help establish benchmarks to guide future monitoring efforts to track the health of the environment. If needed, it will form the basis of regulatory measures to reduce Minnesota's emissions and Minnesota's citizen exposure. This "information gathering" step is essential before proceeding to the risk assessment or risk management process.

Project Milestones:	**Dates:**
Develop BFR List of Concerns	10/2000
Assess Status of BFRs	02/2001
Review Regulations - Control Programs	07/2001
Identify Control Options	08/2000
Create USGS and Storet Data Files	09/2001
Develop CD and Training Programs	09/2001
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☐ Project Addresses Environmental Justice

If So, Description of How:

☒ Project Addresses Education/Outreach

If So, Description of How:

The result of this project will be used to develop an educational package on flame-retardants and their environmental effects. Training workshops will be offered to stakeholders and MPCA staff. CD-based ArcView projects of the database will be developed. This study will be one of the first report providing information on Flame retardants as a highly toxic, persistent, and bioaccumulative chemical (PBTs). Local high schools, colleges and universities will be able to incorporate this educational package and the easy to use database into their environmental science program. Outreach will be done to let Minnesota's citizens learn more about their environment. Main product of this research will be conference presentations and professional papers in high quality scientific journals.

Project Budget:

	Federal Share Requested ($)	Applicant's Share ($)
Personnel:	20,000	2,000
Fringe:	4,200	420
Travel:	5,000	0
Equipment:	0	0
Supplies:	15,000	0
Contracts:	0	0
Construction:	0	0
Other:	10,772	474
Total Direct Costs:	54,972	2,894
Indirect Costs:	7,028	370
Total:	62,000	3,264
Projected Income:	0	0

Funding by Other Organizations (Names, Amounts, Description of Commitments):

Five percent of the entire project costs will be provided in cash, or by in-kind contributions and other non-cash support, from the MPCA.

Description of Collaboration/Community Based Support:

Community-based support will be obtained from grass roots community groups dealing with Persistence Bioaccumulative Toxic Chemicals (PBTs), and may also be obtained through the technical transfer of information about the database at local environmental fairs.